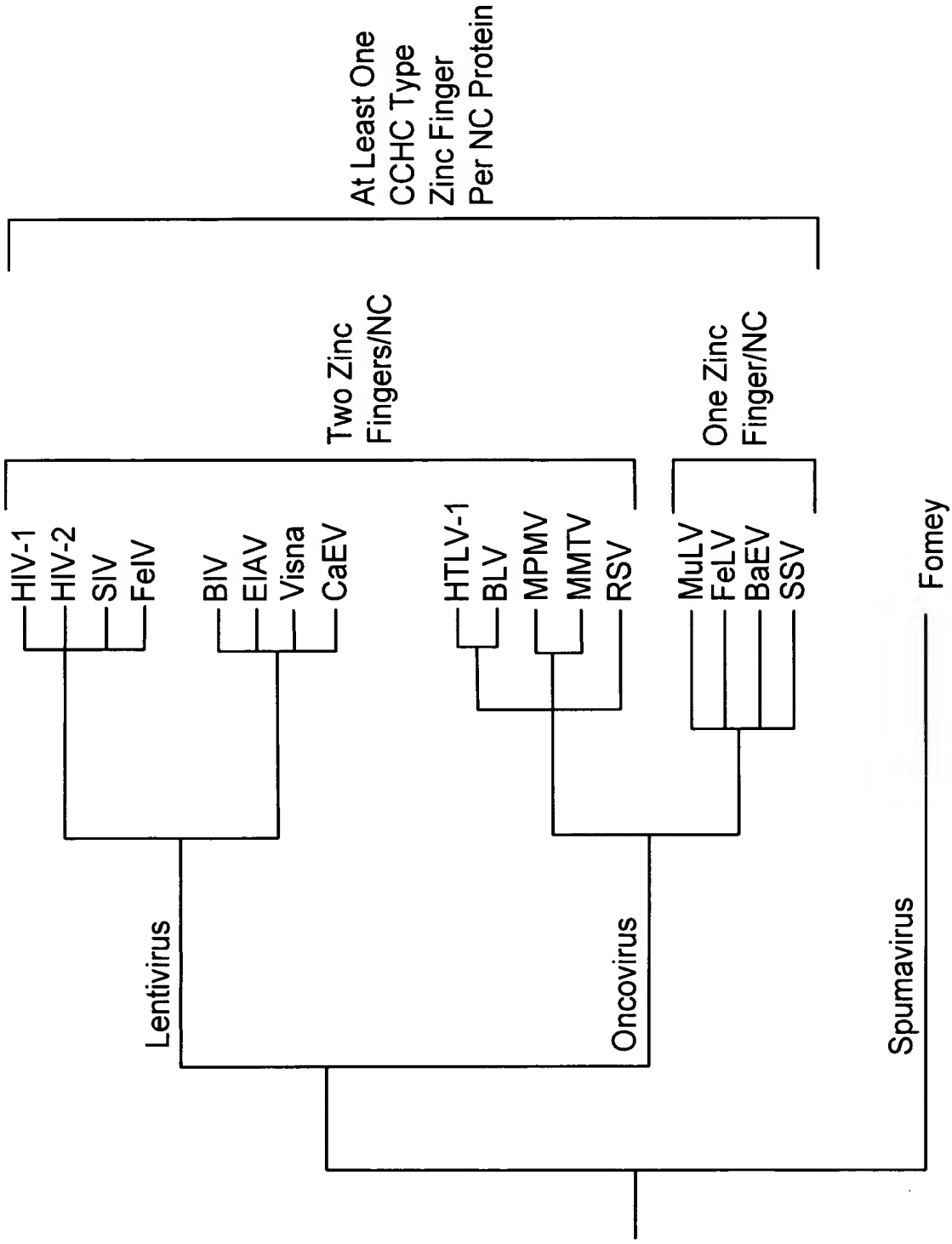
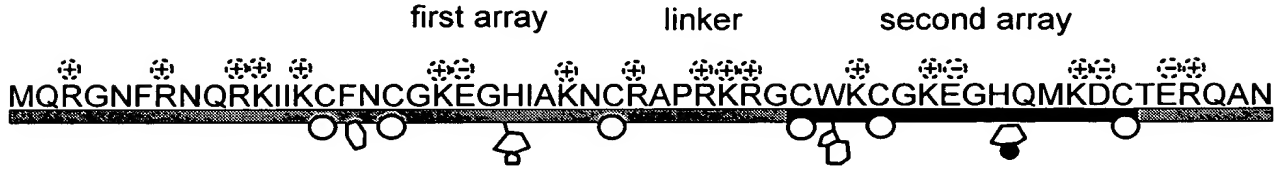

At Least One CCHC Type Zinc Finger Per NC Protein
Two Zinc Fingers/NC
One Zinc Finger/NC
HIV-1
HIV-2
SIV
FeIV
BIV
EIAV
Visna
CaEV
HTLV-1
BLV
MPMV
MMTV
RSV
MuLV
FeLV
BaEV
SSV
Fomey
Lentivirus
Oncovirus
Spumavirus

FIG. 1



Total Residues.....55
Basic Residues.....15
Acid Residues.....4
Net Charge.....+11
IEP.....10.77

Molecular Weight.....6451.5

280nm Molar Absorption.....6050

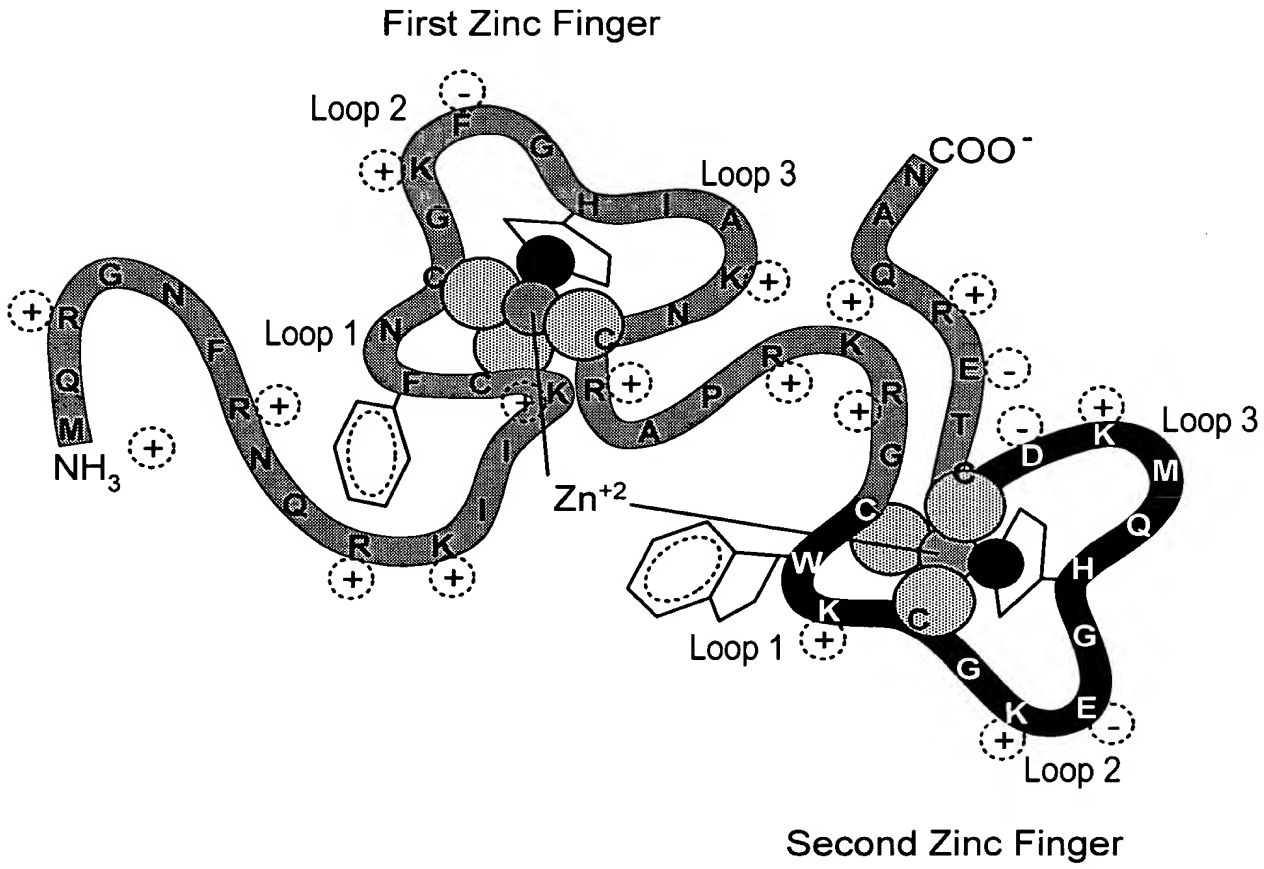


FIG. 2

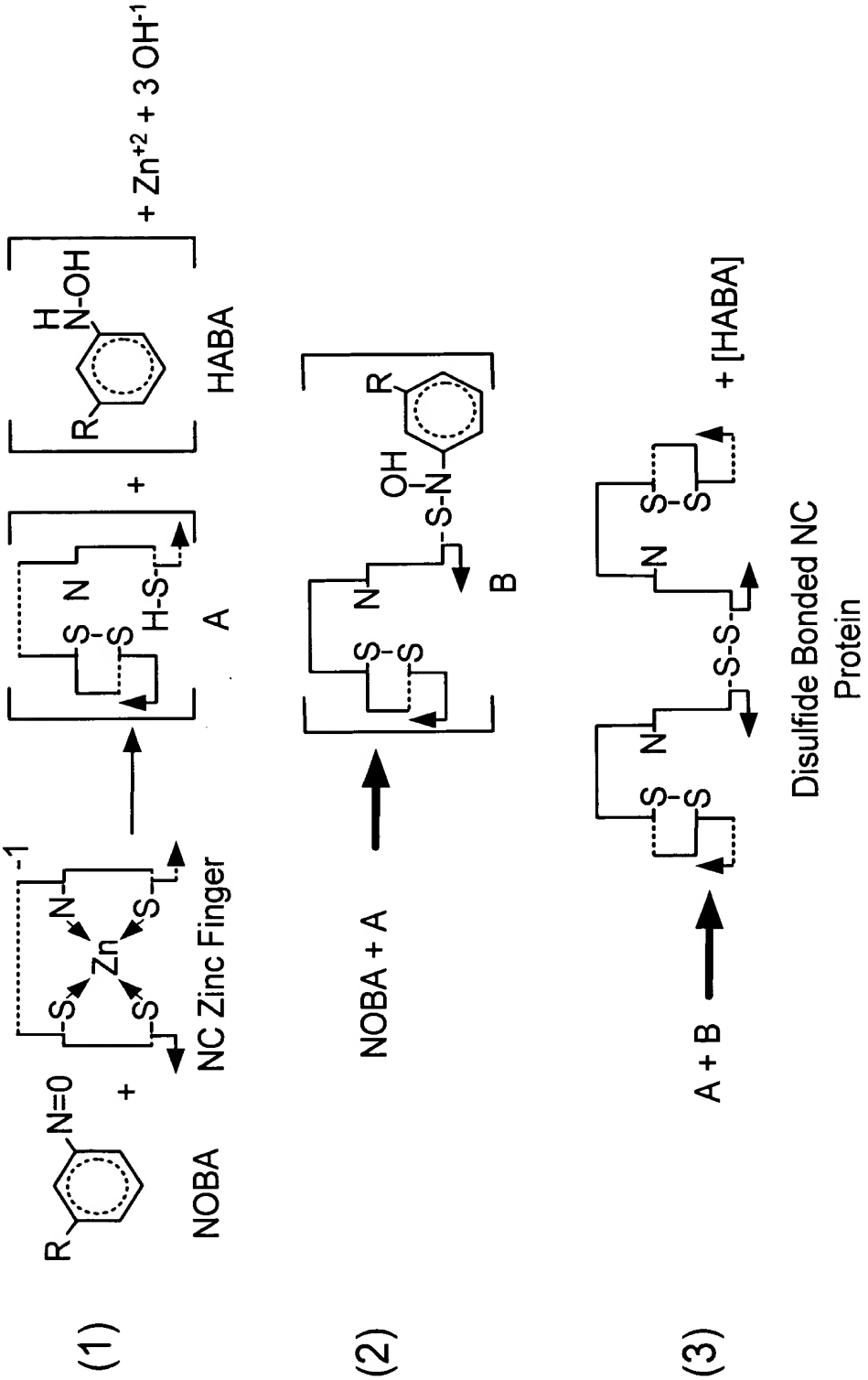

(1)
NOBA
+
NC Zinc Finger
HABA
+ Zn^{+2} + 3 OH^{-1}
(2)
NOBA + A
B
(3)
A + B
Disulfide Bonded NC Protein
+ [HABA]

FIG. 3

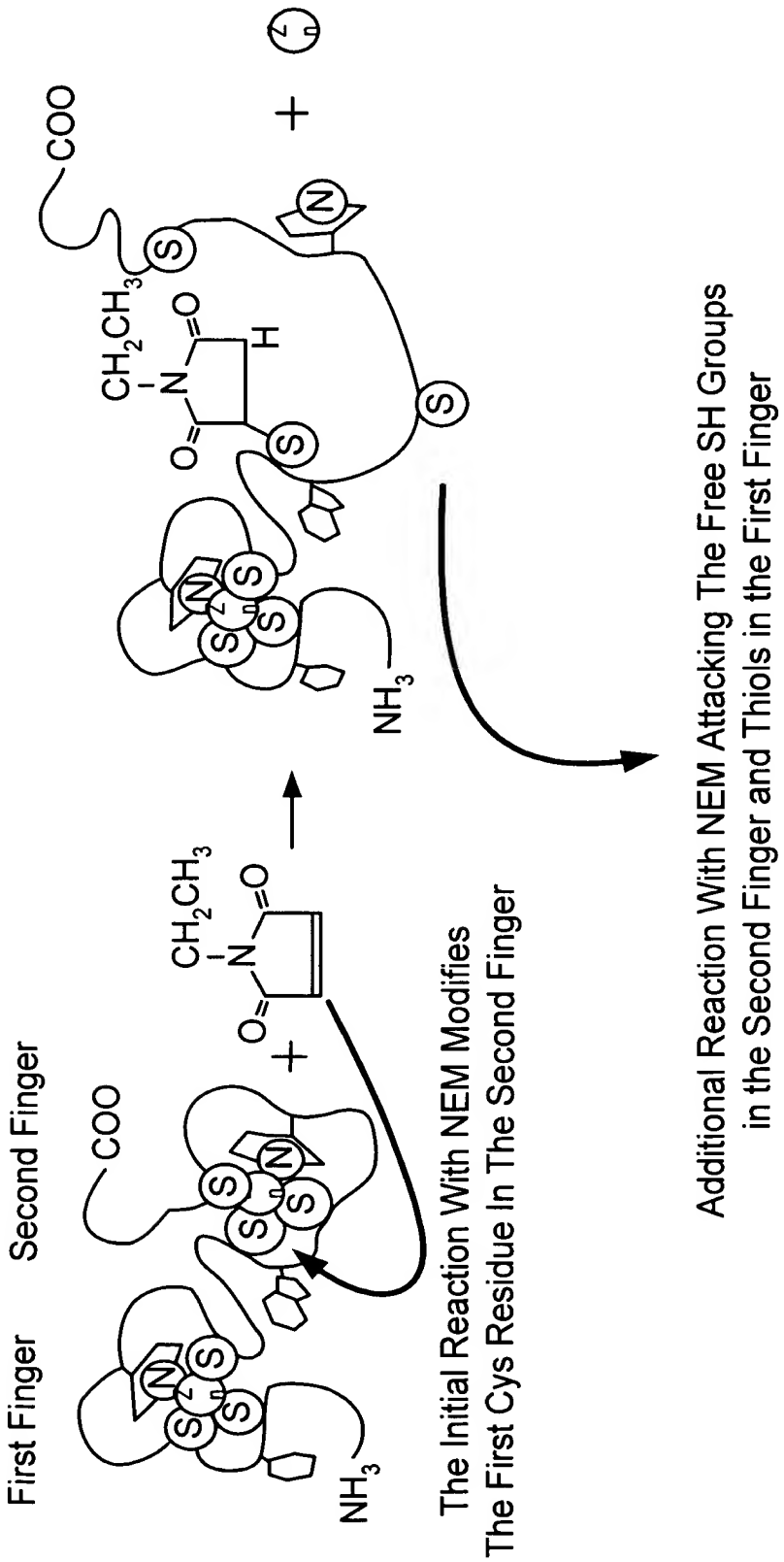
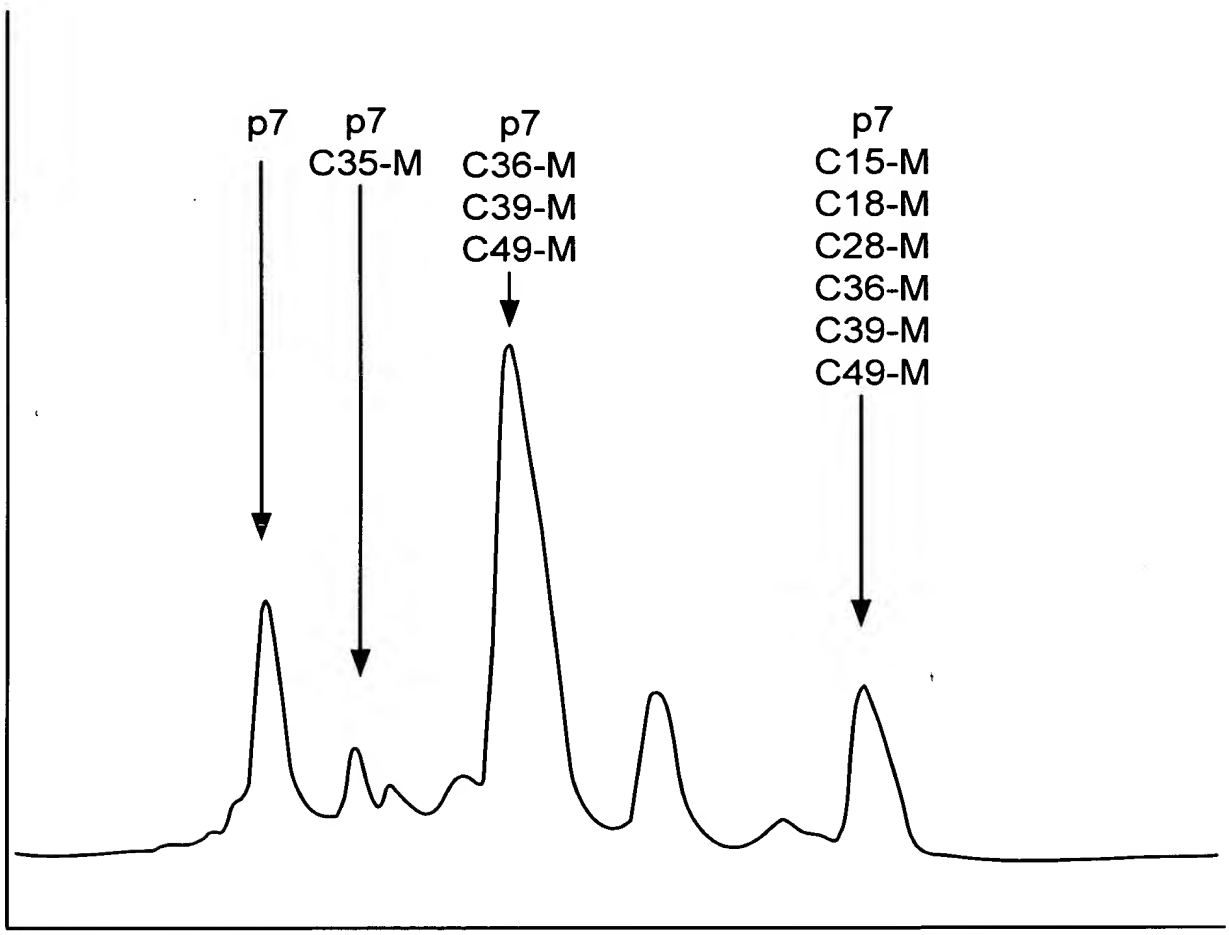

First Finger
Second Finger
COO
NH3
The Initial Reaction With NEM Modifies
The First Cys Residue In The Second Finger
Additional Reaction With NEM Attacking The Free SH Groups
in the Second Finger and Thiols in the First Finger

FIG. 4



Reaction conditions: 52 mM p7NC + 744 mm NEM; pH 7.0, 60min. at RT. The positions of alkylated Cys residues were determined by sequence analysis of separated proteins and are indicated by the notation C#-M.

FIG. 5

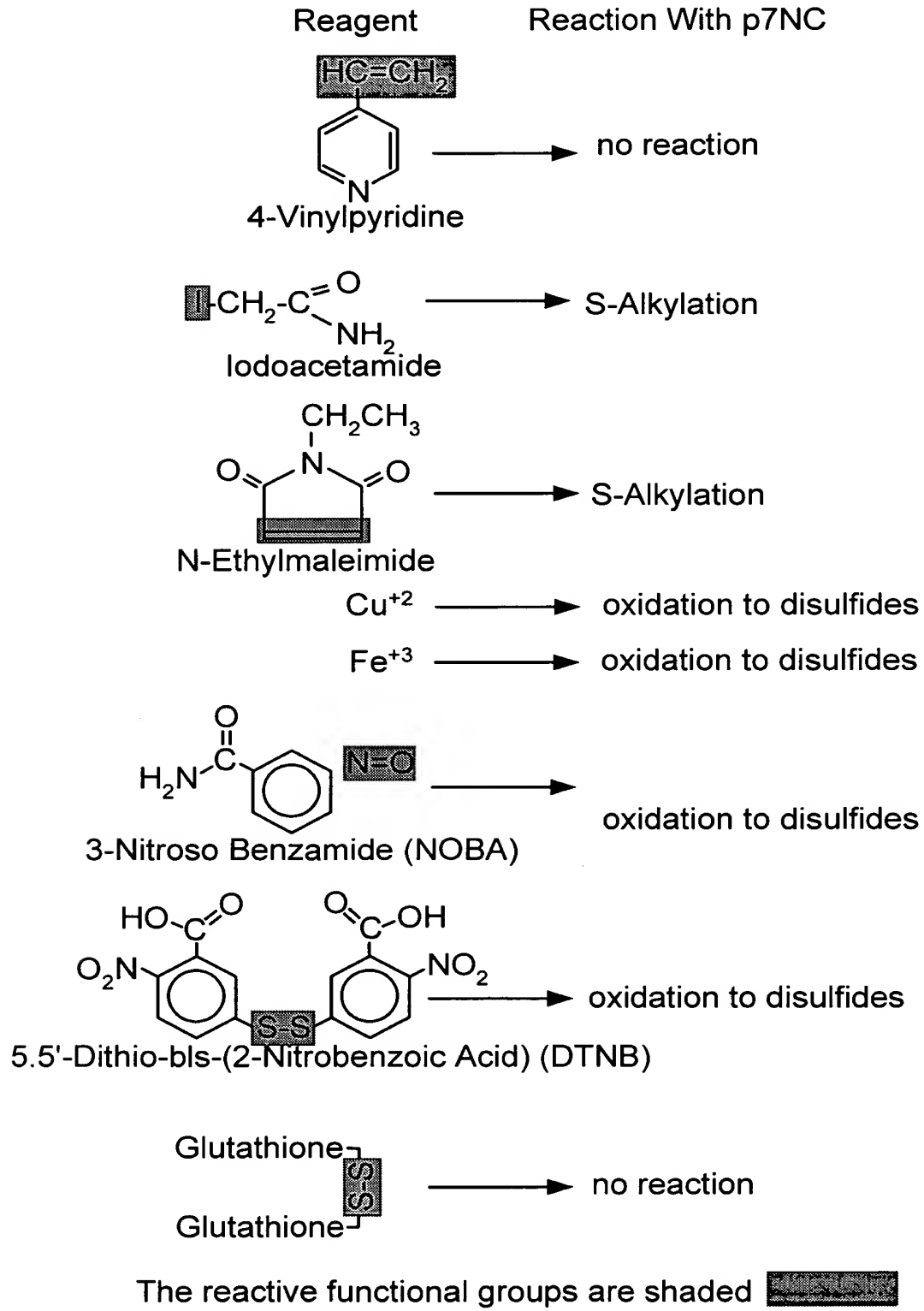
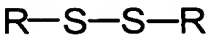
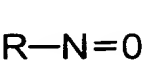
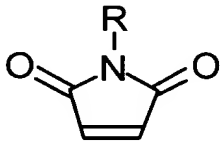
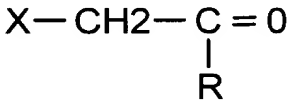
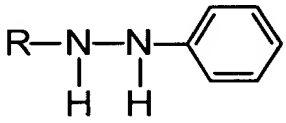

Reagent
Reaction With p7NC
HC=CH2
no reaction
4-Vinylpyridine
I-CH2-C=O
NH2
S-Alkylation
Iodoacetamide
CH2CH3
S-Alkylation
N-Ethylmaleimide
Cu+2
oxidation to disulfides
Fe+3
oxidation to disulfides
N=O
oxidation to disulfides
3-Nitroso Benzamide (NOBA)
HO-C=O
O2N
O=C-OH
NO2
S-S
oxidation to disulfides
5.5'-Dithio-bls-(2-Nitrobenzoic Acid) (DTNB)
Glutathione
S-S
Glutathione
no reaction
The reactive functional groups are shaded

FIG. 6

disulfides	
nitroso compounds	
maleimides	
α-halogenated ketones	
phenylhydrazids	
Nitric Oxide and Derivitives	NO
cupric ions and complexes	Cu^{+2}
ferric ions and complexes	Fe^{+3}

where R is any atom or molecule, and X is selected from the group consisting of F, I, Br and Cl.

FIG. 7

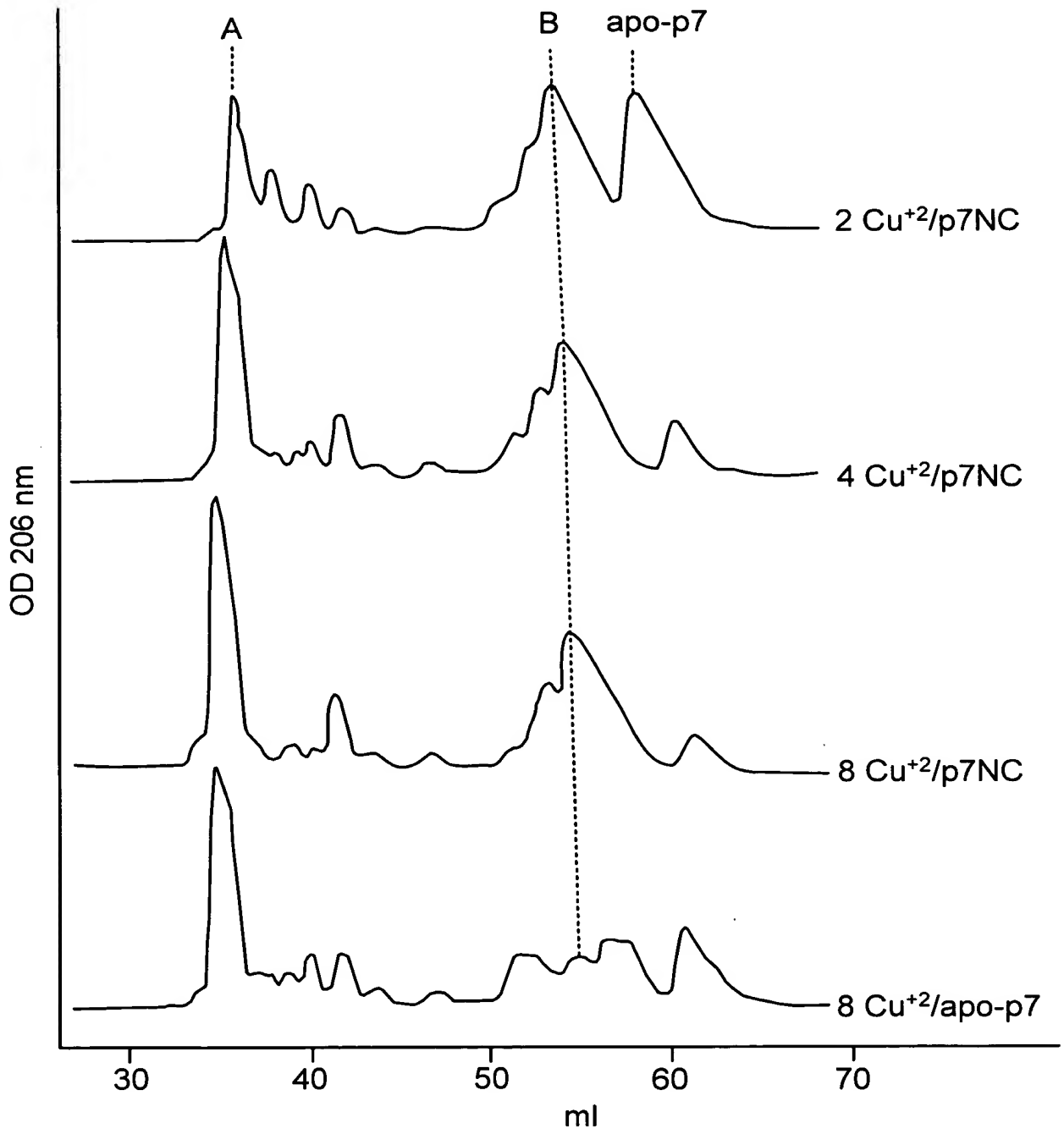

A
B
apo-p7
2 Cu+2/p7NC
4 Cu+2/p7NC
8 Cu+2/p7NC
8 Cu+2/apo-p7
OD 206 nm
30
40
50
60
70
ml

FIG. 8

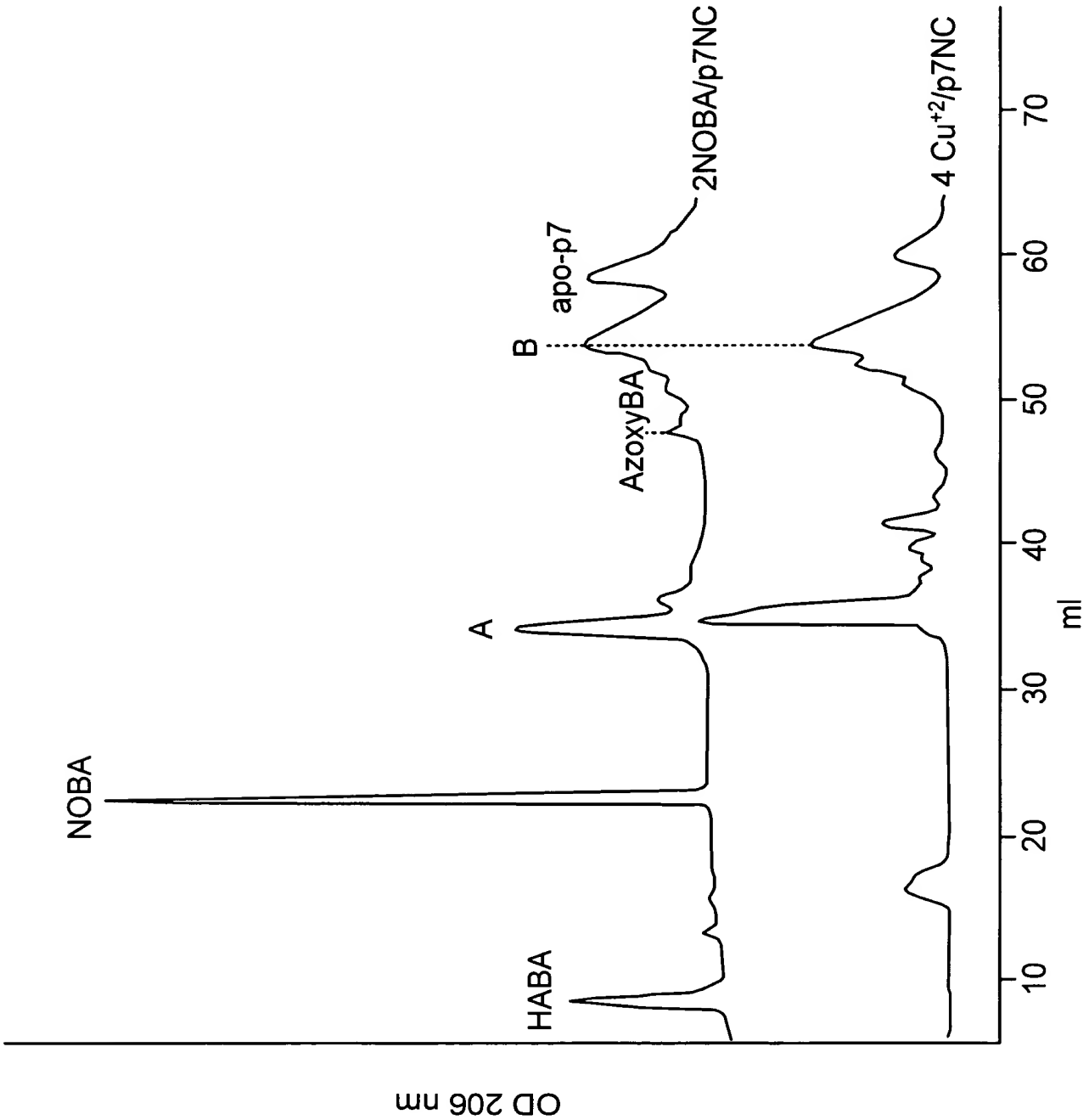

OD 206 nm
NOBA
HABA
A
B
apo-p7
AzoxyBA
2NOBA/p7NC
4 Cu+2/p7NC
10
20
30
40
50
60
70
ml

FIG. 9

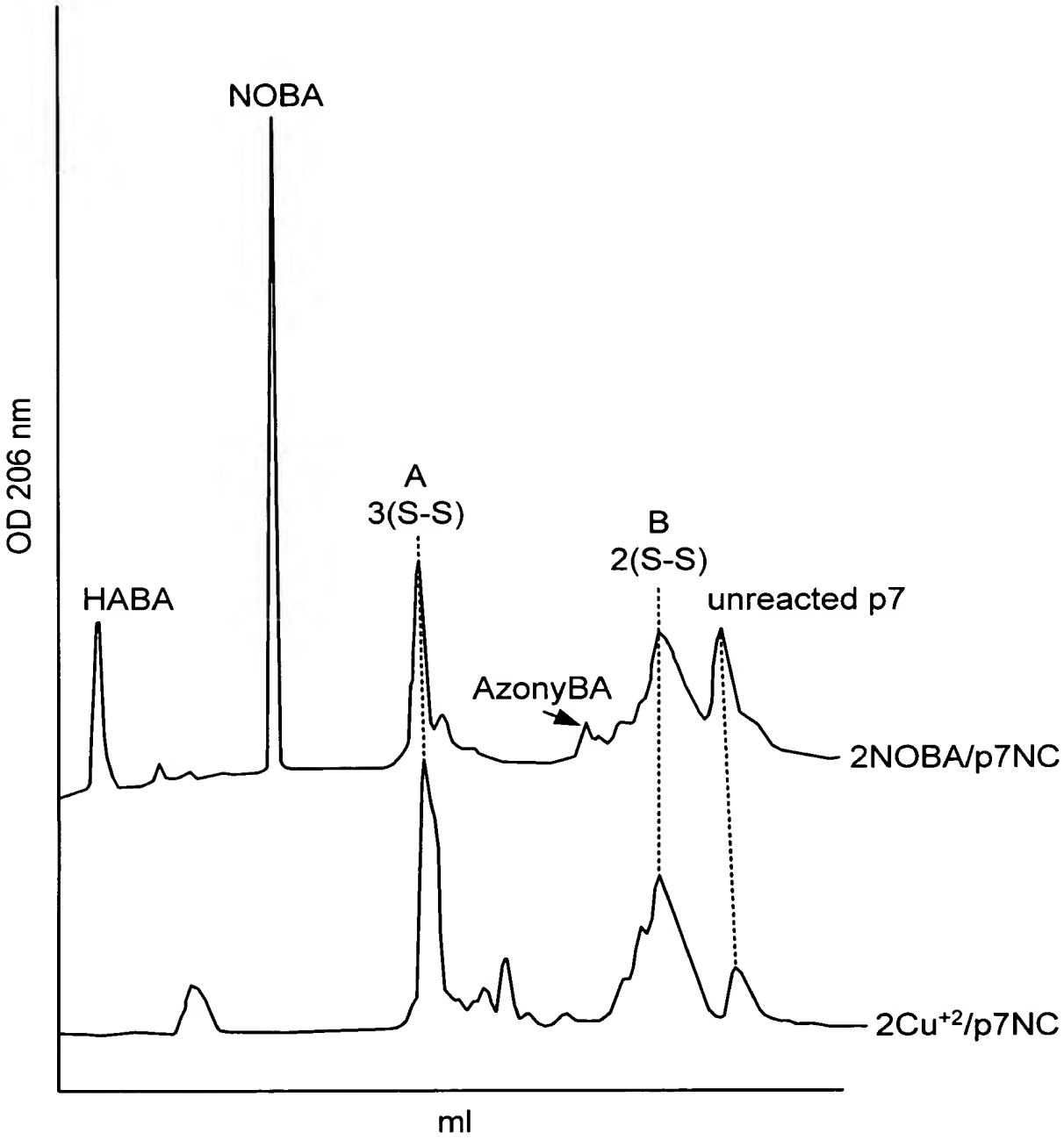

NOBA
A
3(S-S)
B
2(S-S)
HABA
unreacted p7
AzonyBA
2NOBA/p7NC
2Cu+2/p7NC
OD 206 nm
ml

FIG. 10

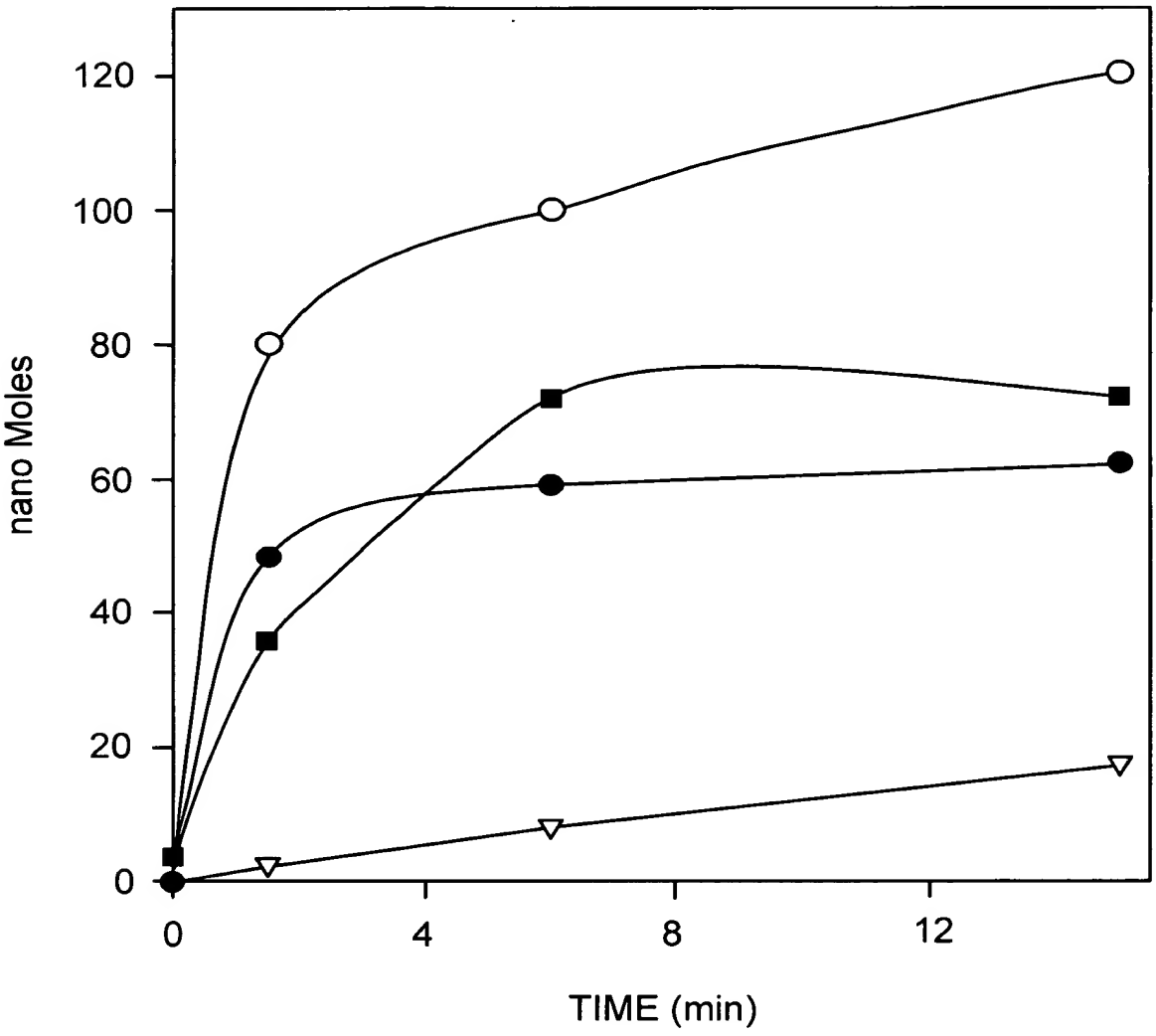


FIG. 11

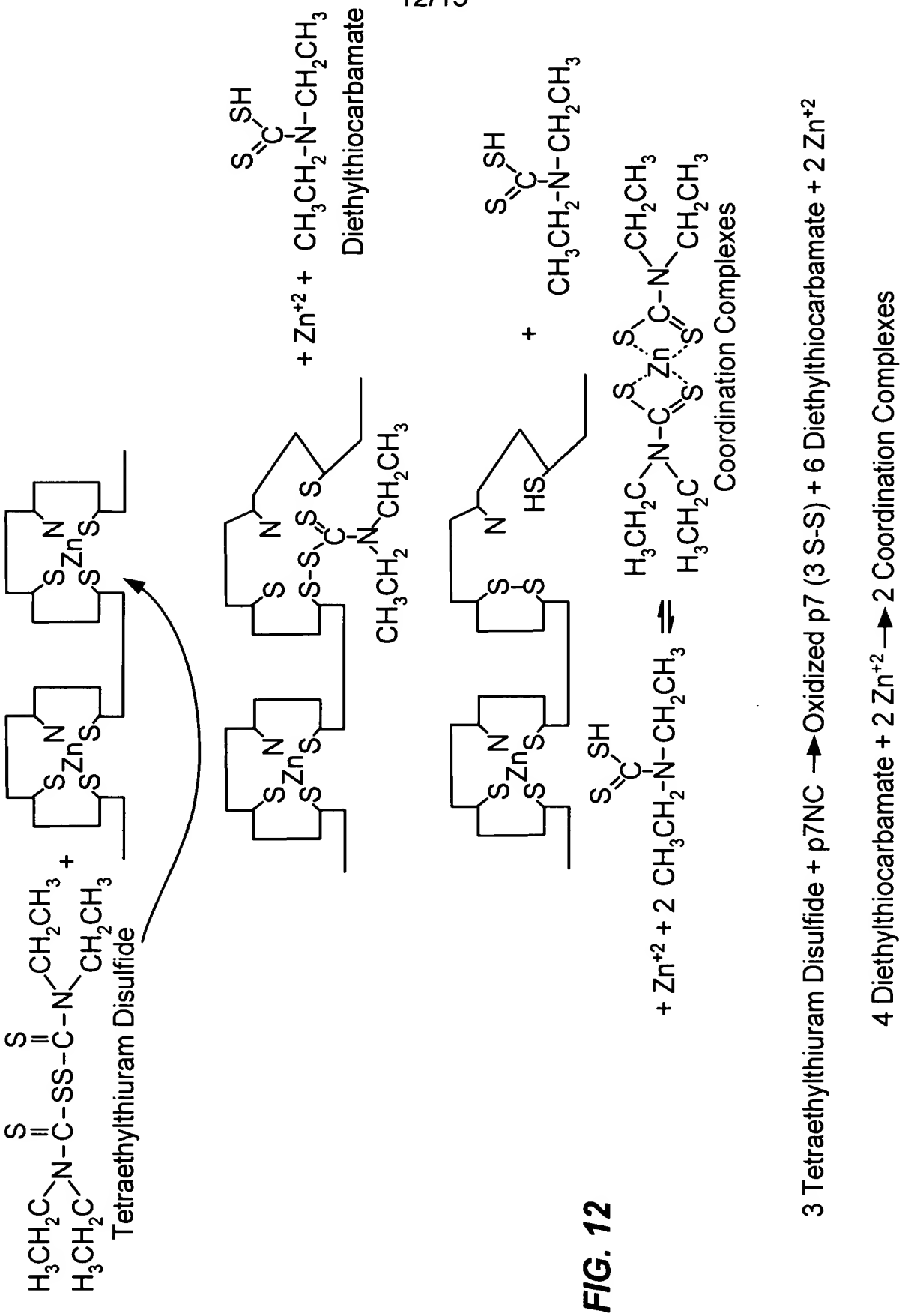


FIG. 12

3 Tetraethylthiuram Disulfide + p7NC → Oxidized p7 (3 S-S) + 6 Diethylthiocarbamate + 2 Zn^{+2}

4 Diethylthiocarbamate + 2 Zn^{+2} → 2 Coordination Complexes

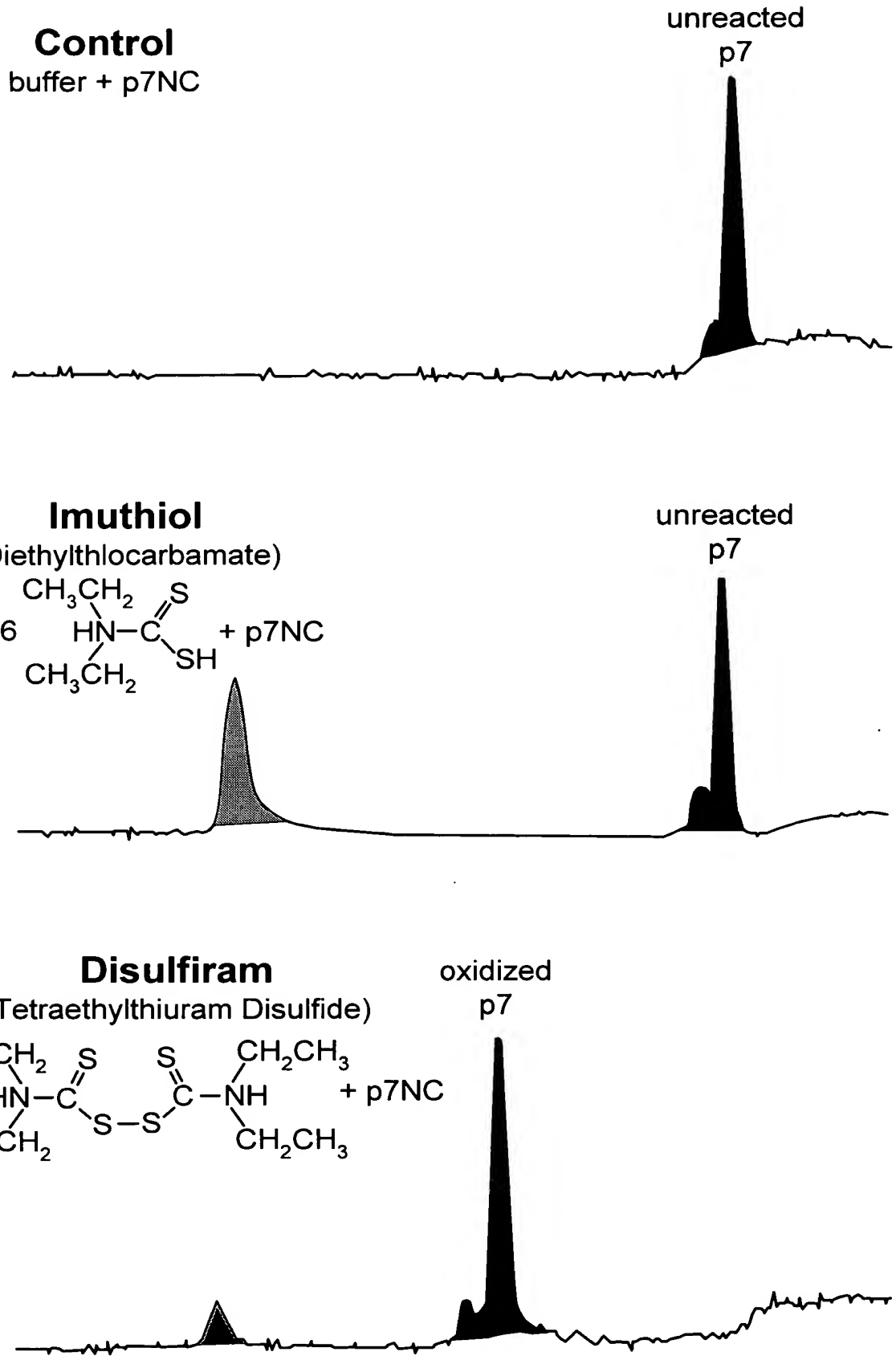
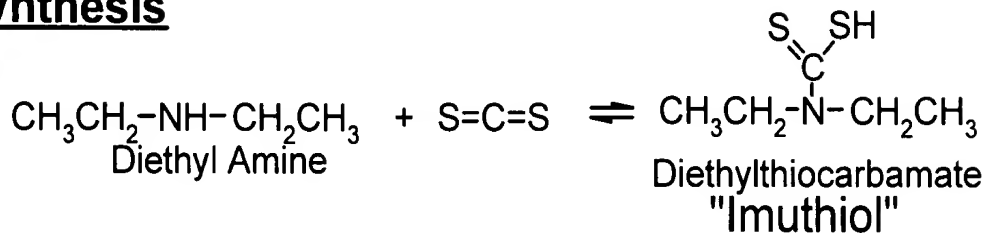
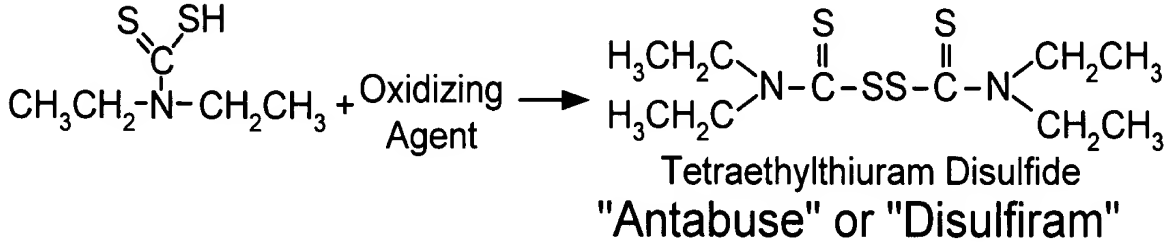

Control
buffer + p7NC
unreacted
p7
Imuthiol
(Diethylthlocarbamate)
6
+ p7NC
unreacted
p7
Disulfiram
(Tetraethylthiuram Disulfide)
+ p7NC
oxidized
p7

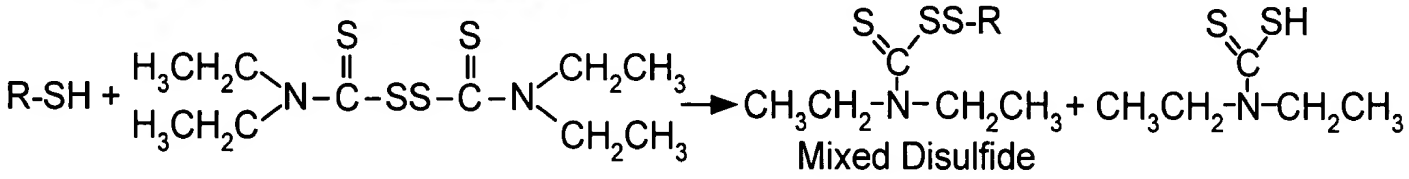
FIG. 13

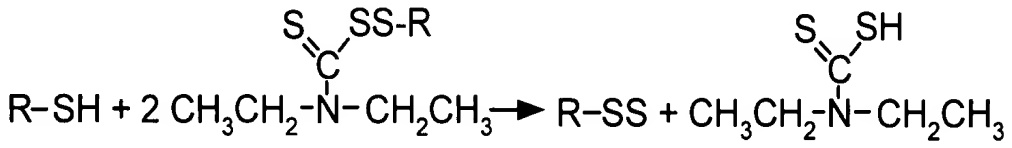
Synthesis





General Reactions





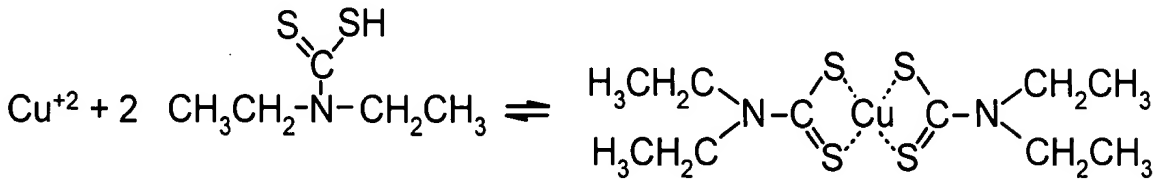
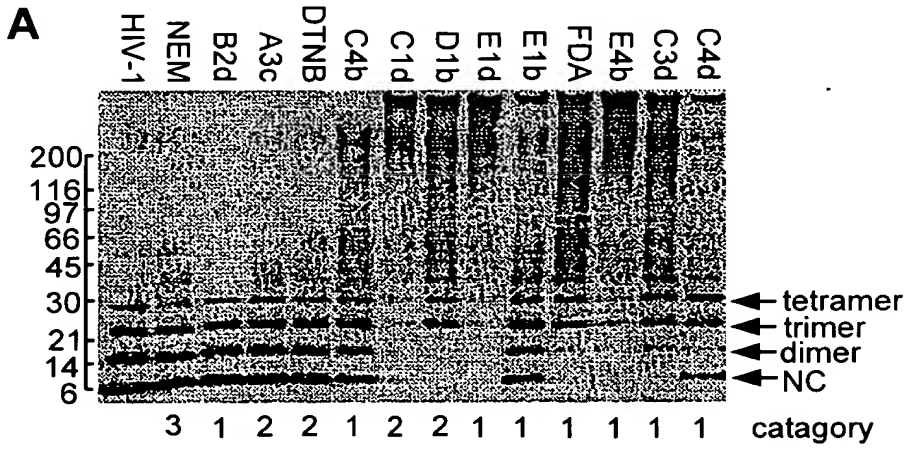
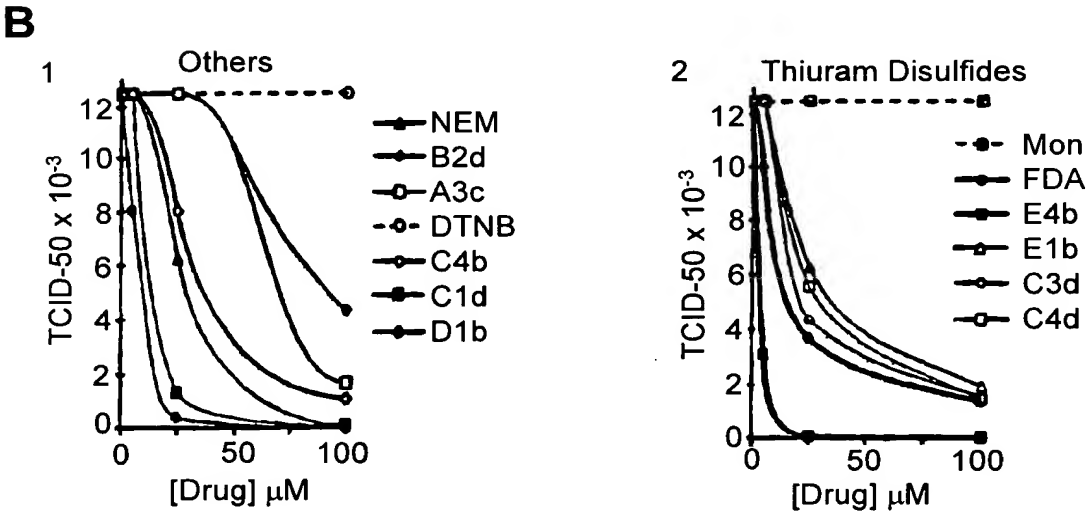


FIG. 14





C

	Compounds	Oral Toxicity (Mouse) LD-50 (g/kg)
FDA	(Tetraethylthiuram disulfide)	1.98
E4b	(Dicyclopentamethylenethiuram disulfide)	2.87
E1b	(Tetramethylthiuram disulfide)	2.35
C4d	(Tetrabutylthiuram disulfide)	1.35
C3d	(Tetraisopropylthiuram disulfide)	
E1d	(2,2'-Dithiobis(Pyridine N-Oxide)	
D1b	(Aldrithiol-2)	
C1b	(2,2' Dithiobis(benzonitrile)	
C4b	(Foramidine disulfide)	
A3c	(Benzoly Disulfide)	
B2d	(4-(dimethylamino)phenyl disulfide)	

FIG. 15